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ART 34 AND**Electronic board for playing banko or bingo**

5 The present invention relates to an electronic board for playing banko or bingo comprising rows and columns forming squares containing numbers, and which board comprises printed numbers in at least some of the squares formed in rows and columns. When the board is in use during playing the game, a caller transmits drawn numbers to the players, where players mark drawn numbers on the board, and where a game ends when a player has marked a defined number of rows or columns and switches the caller.

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US 6,345,941 B2 describes electronic equipment for playing bingo-like game in a fashion very similar to the well-known game of bingo played with paper cards. The three main functional components are:

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a) a central computer that is used both to determine which sets of faces are downloaded into players' game boards and to reconcile cash received by a salesperson with the number of downloaded games authorized to be played;

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b) players' game boards, each of which is adapted to receive enabling messages from a sales unit, to display enabled sets of playable indicia similar to those of a bingo card and to modify that display responsive to a player's input; and

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c) the sales unit, which is adapted both to send an enabling message to a player's game board responsive to a manual input from a salesperson, and to record each such enabling transaction for later upload to the central computer. Another feature of the system is a switching arrangement for controlling an LCD display in a manner similar to the use of a conventional ink dauber in marking a paper bingo card. This may be done by using a permanent magnet disposed on a similar dauber that cooperates with a Hall effect, or other, magnetic field sensor disposed behind an LCD display cell.

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Bringing the dauber proximate to the displayed cell causes the sensor to provide an output to a display controller which replaces the previously displayed indicium with a modified one until the display is reset.

The automatic bingo game is much too complicated for many elderly users. They cannot control the game as they can when playing bingo in the traditional way. In banko, which game is a well-known primitive form for bingo, and which is widely used in Denmark, marking of drawn numbers is effected by placing pieces of paper or coins on the board. Use of a dauber or any other tool will delay the game. In addition, many persons playing the game use both hands simultaneously for marking. For these people the use of a tool in any form is impossible because of the delay in the marking process, and the marking process requires more concentration by the player, which diverts the concentration of the player away from the caller to the marking process. This can lead to frustration for the player and reduce the player's possibility for success.

US 4,624,462 describes an electronic card and board game for playing bingo, keno, and similar games, wherein the master game board being operated by the caller generates and transmits random bingo numbers and game patterns, and the player's game board receives and processes the bingo numbers and game patterns, and the player's game board receives and processes the received information in conjunction with locally originated data determining the contents of a multiple bingo card. The multiple bingo card is implemented as a replaceable, removable transparent template bearing imprinted bingo numbers. In working position, the card overlays a dot-matrix display incorporated in the player's game board. The display is controlled by a microprocessor. The microprocessor activates the display dots located beneath the bingo numbers matching those transmitted by the master board via a radio channel. The microprocessor computes bingo numbers on the card using the identification number of the card in accordance with a predefined algorithm.

This is a near full-automatic game, reducing the player to an observer just waiting for a signal indicating success. Most of the fun in playing the game has gone due to the automatic functions. The concentration of the players is moved from the caller and the game, leaving the players with more time for social activities.

Critical situations for the players may occur when playing banko in the traditional way when the markings on the boards are accidentally removed, for example because of

shaking of the table, airflow in the room, or coughing, which can lead to blowing away paper markings on a board and in this way destroy a game for one ore more players.

5 It is the object of the present invention is to provide a manually operated electronic board for banko or bingo comprising means for marking numbers transmitted from the caller in order to avoid the use of coins or pieces of paper for marking.

10 This can be achieved if a board as described in the opening paragraph also contains at least printed numbers in the rows and columns, and comprises electronic switches that are activated by pressing the numbers by the player's fingers, which switches activate marking elements placed in conjunction with the pressed number, which marking elements remain activated during the game.

15 In playing the game, the player can operate the board in a way very similar to that used in traditional game playing. To the player, touching the number and activating the switch instead of placing a marking element on the number very much resembles manual board playing. In addition, the risk of removing markings by accident is totally eliminated. Just pushing a switch is much easier for the player than using the known marking methods, and allows the player to be more concentrated on the transmission  
20 of drawn numbers. For some very skilled players, this invention even enables them to operate several boards simultaneously. The transmission of drawn numbers can be manually calling maybe using amplifiers. Use of one or more displays is possible in the same time as calling take place. Also radio transmission of called numbers is possible.

25 Reactivating a number can lead to deactivating the marking element. Hereby errors can be corrected if a player has activated the wrong switch. In traditional banko a marking element can be removed and replaced by moving the marking element to another position. Using the new board for moving a marking is just as easy as with  
30 traditional paper boards.

The board according to the invention can comprise a reset function activated by a reset switch for deactivating all marking elements. For the player this makes start of a new

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game easy compared with the traditional game where marking elements have to be removed.

5 The marking elements can be LED elements placed in holes in the surface of the board where the LEDs transmit light upwards from the board towards the player. The LEDs emit light so they are easy to observe even in a relatively dark room. When using LEDs, different colours are possible, and different rows and columns can be designed with different colour LEDs.

10 In an alternative embodiment, the marking elements can be formed as LCD indicators placed in conjunction with the printed numbers on the board. The LCD indicators reflect light, and LCD displays have the advantage that they can operate with limited power consumption.

15 The LCD display can be formed under the numbers if these numbers are printed on a transparent medium and the backgrounds under and around the numbers are black, so that a number becomes invisible upon activation of the switch. In this way, a drawn number is marked in a very efficient way, and players can concentrate on the remaining unmarked numbers.

20 In yet another embodiment, LED indicators can be formed as circles around the numbers so that a number upon marking is surrounded by a black circle. Circles around numbers are an alternative marking by which the numbers remain visible to the player. This makes it possible to check the drawn numbers.

25 In the most simple embodiment, an LCD indicator can be formed as a dot placed in conjunction with the number so that drawn numbers become marked by black dots. This embodiment also makes it possible to check drawn numbers. The small dot can also be placed next to a switch.

30 The switches can be connected to flip-flop input terminals, and the marking elements are connected to flip-flop output terminals, which flip-flop comprises reset terminals

connected to the reset switch. In this way, traditional electronic components can be used.

The flip-flops can be formed of interconnected NAND gates, where a plurality of NAND gates is formed on the same chip. With high numbers of chips to be manufactured, this can lead to very cost-efficient production.

In another alternative embodiment, the switches communicate with a microprocessor, which microprocessor controls the marking elements. The use of a microprocessor is an alternative to the use of NAND gates, and because the microprocessor contains a program for operation, this program can be modified if new functions are to be added, or existing functions are to be modified.

## Detailed description

The invention is described in more detail below with reference to the accompanying drawing in which

Fig. 1 shows an embodiment of a single board;

Fig. 2 shows an alternative embodiment where three single boards are combined;

Fig. 3 shows a further alternative embodiment containing six single boards combined;

Fig. 4 shows an alternative embodiment comprising six single boards placed side by side; and

Fig. 5 shows a single board; and

Fig. 6 shows an alternative embodiment of the invention; and

Fig. 7 shows a second alternative embodiment of the invention; and

Fig. 8 shows a diagram over a one possible solution for a part of the electronic circuit.

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Fig. 1 shows a board 2 comprising rows and columns forming squares 4 and 6 respectively, where 4 refers to a square having a number, and 6 refers to a square not having a number. The electronic board can be switched on by pushing a switch 8, and a reset function can be activated by pushing a switch 10. Indicating means (not shown) can be placed in conjunction with the various numbers so that the squares are marked in one way or another if the square is pressed, and an underlying switch is activated.

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Fig. 2 shows an alternative embodiment comprising three single boards combined in a unit 102 with squares having numbers 104 and empty squares 106. The switch 108 is for switching on the equipment, and the switch 110 is for reset of the equipment.

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Fig. 3 shows a board 202 comprising six single boards in total combined in one unit where squares 204 contain numbers, and squares 206 are empty squares. The switch 208 is for switching on the equipment, and the switch 210 is for reset of the equipment.

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Fig. 4 shows a board 302 comprising six single boards placed in two different rows. Squares 304 contain numbers where squares 306 are empty squares. The switch 308 is for switching on the equipment and the switch 310 is for reset of the equipment.

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Fig. 5 shows an alternative embodiment of the invention with squares 404 containing numbers, and squares 406 that are empty. The switch is shown as having two different positions 414 for ON, and 412 for OFF. There is no reset function as such, instead reset is effected by switching off the equipment. Indicators 416 are shown in each of the squares 404 and 406. The indicator 416 is activated by pressing switches placed under squares 404 that comprise numbers. Activating a switch 404 under a number changes the indicator 416 so as to indicate an activated situation as indicator 418.

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The switch 404 placed under the squares can be formed as plastic foil switches where different layers of plastic foil are isolated towards each other as long as there is no pressure on the switch. Then when the switch is activated, the foil layers are pressed against each other, and an electric circuit is established. The indicators 416 can be formed as light-emitting diodes (LEDs), or they can be formed as liquid crystal displays (LCDs).

The LCD indicators can be formed in various ways, and they can be formed with an entirely black background 618 under the numbers 604, so that when the LCD is activated, the numbers 604 disappear because the background 618 under the number assumes the same dark colour as that of the number. It is also possible to use an LCD as a circle 518 surrounding a number 504 where the LCD circle 518 becomes dark upon activation and in this way will surround the number, but many other embodiments are possible using LCDs. As an alternative, only a small dot 416 in one of the corners of each square can be an LCD indicator.

Fig. 6 shows an alternative embodiment of the invention with squares 504 containing numbers, and squares 506 that are empty. The switch is shown as having two different positions 514 for ON, and 512 for OFF. There is no reset function as such, instead reset is effected by switching off the equipment. Indicators 516 are shown in each of the squares 504 and 506. The indicator 516 is activated by pressing switches placed under squares 504 that comprise numbers. Activating a switch 504 under a number changes the indicator 518 so as to indicate an activated situation. The indicator 518 is formed as a black circle surrounding the marked number.

Fig. 7 shows a second alternative embodiment of the invention with squares 604 containing numbers, and squares 606 that are empty. The switch is shown as having two different positions 614 for ON, and 612 for OFF. There is no reset function as such; instead reset is affected by switching off the equipment. Indicators 616 are shown in each of the squares 604 and 606. The indicator 616 is activated by pressing switches placed under squares 604 that comprise numbers. Activating a switch 604 under a number changes the indicator 618 so as to indicate an activated situation. The indicator 618 is formed as a black square placed under the number. By activations the

number gets invisible because of the black background. Special LCD displays can be used as a black background for the number. Alternative to a black background other grey scale indicators are possible, which can lead to a visible number over the background. Colour backgrounds are also possible.

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Fig. 8 shows one of many possible solutions for an electronic circuit for control of an indicator based on contact activation. A power source 722 is connected to a switch 705 activated by pressing down a number of a board 704. From the switch 705 a line leads to an input terminal 724 of an electronic circuit 720. A first activation of the input terminal 724 forces an output terminal 732 over a line to turn on an indicator 716, where the indicator 716 over a line 734 is connected to ground. The power source 722 is also connected to a reset switch 710, which switch is connected further to a reset terminal 726. The power source 722 is also permanent over power switch 708 connected to a power terminal 728 on the circuit 720. The circuit 720 is connected to ground by a terminal 730.

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The circuit 720 has to switch on the indicator 716 if the switch 705 is activated. A reactivation of the switch 705 has to switch off the indicator 716. Activation of the reset switch 710 over terminal 726 has to switch off the indicator 716, but if the indicator is already switched off no action has to take place. The function described can be fulfilled by a flip-flop which is a well known integrated electronic circuit.

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As an alternative the function can be achieved by interconnection of a number of nand gates. In this way a full integration of the whole electronic functions for the board can be achieved in a single integrated circuit.

The power source 722 can be a battery which can be changed after a period of use. By using LED indicators the lifetime for a battery might be longer than a year. The battery might be rechargeable and a solar panel can be formed at the board for battery charging. In this way the battery can have a lifetime as long as the board and battery change never take place.

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# CLAIMS

1. Electronic board (2, 102, 202, 302, 402, 502, 602) for playing banko or bingo, comprising rows and columns forming squares (6, 106, 206, 306, 406, 506, 606) containing numbers (4, 104, 204, 304, 404, 504, 604), and which board (2, 102, 202, 302, 402, 502, 602) comprises printed numbers (4, 104, 204, 304, 404, 504, 604) in at least some of the squares (6, 106, 206, 306, 406, 506, 606) formed in the rows and columns of the board (2, 102, 202, 302, 402, 502, 602), when in use during playing the game, a caller transmits drawn numbers to players, where players mark drawn numbers on the board (2, 102, 202, 302, 402, 502, 602), where a game ends when a player has marked a defined number of rows or columns and contacts the caller, **characterized in that** at least the squares (6, 106, 206, 306, 406, 506, 606) containing printed numbers (4, 104, 204, 304, 404, 504, 604) in the rows and columns comprise electronic switches activated by pressing down the squares (6, 106, 206, 306, 406, 506, 606) containing numbers (4, 104, 204, 304, 404, 504, 604), which switches in operation activate marking elements (418, 518, 618) placed in conjunction with the pressed squares (6, 106, 206, 306, 406, 506, 606), which marking elements (418, 518, 618) remain activated during the game.

2. Electronic board according to claim 1, **characterized in that** reactivating a numbered square (6, 106, 206, 306, 406, 506, 606) leads to deactivating the marking element (418, 518, 618).

3. Electronic board according to claim 1 or 2, **characterized in that** the board (2, 102, 202, 302, 402, 502, 602) comprises a reset function activated by a reset switch for deactivating all marking elements (418, 518, 618).

4. Electronic board according to any of the claims 1-3, **characterized in that** the marking elements (418, 518, 618) are LED elements placed in holes in the surface of the board (2, 102, 202, 302, 402, 502, 602), where the LEDs transmit light upwards from the board (2, 102, 202, 302, 402, 502, 602) towards the player.

5. Electronic board according to any of the claims 1-4, **characterized in that** the marking elements (418, 518, 618) are LCD indicators placed in conjunction with the printed numbers (4, 104, 204, 304, 404, 504, 604) on the board (2, 102, 202, 302, 402, 502, 602).

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6. Electronic board according to claim 5, **characterized in that** the LCD display is formed under the numbers, where the numbers (4, 104, 204, 304, 404, 504, 604) are printed on a transparent medium, where the LCD by activation causes the background (618) under and around the number (4, 104, 204, 304, 404, 504, 604) to become black, which numbers (4, 104, 204, 304, 404, 504, 604) become partly invisible upon activation of the switch.

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7. Electronic board according to claim 5, **characterized in that** the LED indicators are formed as circles (518) around the numbers (4, 104, 204, 304, 404, 504, 604), where a number (4, 104, 204, 304, 404, 504, 604) upon marking is surrounded by a black circle (518).

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8. Electronic board according to claim 5, **characterized in that** the LCD indicators are formed as dots (416) placed in conjunction with the numbers (4, 104, 204, 304, 404, 504, 604), which dots (418) become black upon activation of the switch.

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9. Electronic board according to claim 1-8, **characterized in that** the switches are connected to flip-flop input terminals, and the marking elements (418, 518, 618) are connected to flip-flop output terminals, which flip-flop comprises reset terminals connected to the reset switch (10).

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10. Electronic board according to claim 8, **characterized in that** the flip-flops are formed of interconnected NAND gates, where a plurality of NAND gates is formed on the same chip.

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11. Electronic board according to any of the claims 1-8, **characterized in that** the switches communicate with a microprocessor, which microprocessor controls the marking elements (418, 518, 618).